

ſ		n Proie		3-08144	1	BORING:				T-1	
			Evaluatio			LOCATIO		o ott			
<i>(</i>	Broad	way at (Center			LOCATIO	in. Se	e au	acnec	i skelcii.	
tion				Center Street							
revis			innesota	METHOD		DATE	4044	2//2		00415	411 41
app	DRILLE		Keck	METHOD: 3 1/4" HS/	A, Autohammer	DATE:	12/1	9/13		SCALE:	1" = 4'
n of	Elev. feet	Depth feet		Description o	f Materials		BPF	wı	PID	Tests o	r Notes
natic	996.4	0.0	Symbol	(Soil-ASTM D2488 or D2487, R		0-1-2908)	٥	• • •	(ppm)		110003
xpla			FILL	FILL: Poorly Graded Sand w medium-grained, brown, moi							
for e	- 994.4	2.0		medium-graineu, brown, moi	51.	_					
neet	994.4	2.0	FILL	FILL: Poorly Graded Sand w	vith Silt, fine- to						
gy st	_			coarse-grained, trace of Gra	vel, brown, moist.	\dashv	9		0.0		
olon	_					_					
emi						_			0.0		
ive T	_	0.5				1	6		0.0		
See Descriptive Terminology sheet for explanation of abbreviations)	989.9 989.4	6.5 7.0	DOL 7	SHAKOPEE FORMATION,	SANDY DOLOSTO	ONE, _					
Des				light brown and light gray, moweathered, very fine- to fine-	oist, decomposed t	to highly	*			* 50/0" (set)	
(See	_			"Silty Sand (SM)" with Grave	el-sized pieces of S	Sandy					
ľ	_			Dolostone in split-spoon same END OF BORING - REFUSA		7					
ľ				FEET.							
	_			Water not observed while dri	illing.	_					
	_			Water not observed to cave- immediately after withdrawal	in depth of 4 feet of auger.	_					
	_			Boring then backfilled.		_					
1:16											
1/5/15 14:16	_					_					
т 1/5	_					_					
NT.GDT	_					-					
CURRENT	_					-					
2/8/											
BRAUN	_					_					
	_										
3144.0											
313\0											
ER\20	_										
CHEST											
N:\GINT\PROJECTS\ROCHESTER\2013\08144.GPJ	-					-					
OJECT	-					-					
VT\PR	_					-					
N:\GII	_					_					
BORING											
OF BOR	_										
501	PO 12 091										T 1 page 1 of 1



			13-08144	BORING			5	ST-2	
Broad Broad	way at (way Av		on Center Street	LOCATIO	DN: Se	e att	tache	d sketch.	
DRILLE		Keck	METHOD: 3 1/4" HSA, Autohammer	DATE:	12/1	9/13		SCALE:	1" = 4'
Elev. feet	Depth feet	Coursels al	Description of Materials	140.4.0000	BPF	WL	PID	.1	or Notes
995.1	0.0	Symbol FILL	(Soil-ASTM D2488 or D2487, Rock-USACE EM11 FILL: Silty Sand, fine- to coarse-grained, trace				(ppm	1	
993.1	2.0		Gravel, brown, moist.	_			0.2		
		FILL	FILL: Poorly Graded Sand with Silt, fine- to medium-grained, brown, moist.	_	53*		0.2	* High blow	v counts like
991.1	4.0	FILL	FILL: Poorly Graded Sand, fine- to medium- brown, moist.	grained, —	4		0.1	due to nos	
988.1	7.0	FILL	FILL: Poorly Graded Sand with Silt, fine- to						
			coarse-grained, trace of Gravel, brown, mois	t _	3		0.0		
			- Trace Concrete debris noted in 10-foot and samples.	13-foot	46		0.7		
981.1	14.0			-	2		0.2		
_		FILL	FILL: Silty Sand, fine- to coarse-grained, with and pieces of coal slag, dark brown, moist.	n Gravel	2		3.0		
978.1	17.0	FILL	FILL: Poorly Graded Sand with Silt, fine- to						
977.3	17.8	××	coarse-grained, trace of concrete debris at 1 Boring continued as cored borehole	7.5 feet.	*		0.1	* 50/4" (set	t)
				_					
				-					
				_					
				_					
				_					
				-					

Braun Project RO-13-08144 ST-2 (cont.) CORING: **Geotechnical Evaluation** .0G OF CORING N:\GINT\PROJECTS\ROCHESTER\2013\08144.GPJ BRAUN_V8_CURRENT.QBeb\Dbesthiptive Terminology sheet for explanation of abbreviations) LOCATION: See attached sketch. **Broadway at Center Broadway Avenue and Center Street** Rochester, Minnesota DATE: 12/19/13 SCALE: 1" = 1' Rate of Water Elev. Depth Bit Pressure **RQD** Rec. feet feet Advance Remarks Description of Core Press Return % % (psi) 977.3 17.8 (min/ft) (psi) (%) SHAKOPEE FORMATION, DOLOSTONE, light gray and 4650 3.0 79 17.8 15-20 100 52 977.3 gray, moist, highly weathered, moderately hard, very finegrained, thin-bedded, intensely to highly fractured, vuggy. 2.0 975.3 19.8 SHAKOPEE FORMATION, SANDY DOLOSTONE, gray and 4650 2.0 15-20 100 97 74 Q_{..}= 5,220 psi light brown, moist, highly weathered, moderately hard, very fine- to fine-grained, thin-bedded, highly fractured, vuggy. 3.0 21.6 973.5 SHAKOPEE FORMATION, SANDSTONE, light gray and light brown, moist, highly weathered, moderately hard, very fine- to -2.0 Groundwater fine-grained, thin-bedded, intensely to moderately fractured,observed at vuggy, with thin Dolostone seams throughout. 21.9 feet after 3 days. Continued Next Page NOTES:

Braun Project RO-13-08144 ST-2 (cont.) CORING: **Geotechnical Evaluation** .0G OF CORING N:\GINT\PROJECTS\ROCHESTER\2013\08144.GPJ BRAUN_V8_CURRENT.QBeb/拉德Shiptive Terminology sheet for explanation of abbreviations) LOCATION: See attached sketch. **Broadway at Center Broadway Avenue and Center Street** Rochester, Minnesota DATE: 12/19/13 SCALE: 1" = 1' Rate of Water Elev. Depth Bit Pressure **RQD** Rec. feet feet Advance Remarks Description of Core Press Return % (psi) 972.3 22.8 (min/ft) (psi) (%) SHAKOPEE FORMATION, SANDSTONE, light gray and light 15-20 4650 2.0 100 97 74 brown, moist, highly weathered, moderately hard, very fine- tofine-grained, thin-bedded, intensely to moderately fractured, vuggy, with thin Dolostone seams throughout. (continued) 3.0 970.3 24.8 SHAKOPEE FORMATION, SANDY DOLOSTONE, brown 4650 3.0 15-20 100 81 37 and gray, moist, highly weathered, moderately hard, very fineto fine-grained, thin-bedded, intensely to moderately fractured, vuggy. 2.0 Continued Next Page NOTES:

Braun Project RO-13-08144 ST-2 (cont.) CORING: **Geotechnical Evaluation** .0G OF CORING N:\GINT\PROJECTS\ROCHESTER\2013\08144.GPJ BRAUN_V8_CURRENT.QBeb\Dbesthiptive Terminology sheet for explanation of abbreviations) LOCATION: See attached sketch. **Broadway at Center Broadway Avenue and Center Street** Rochester, Minnesota DATE: 12/19/13 SCALE: 1" = 1' Rate of Water Elev. Depth Bit Pressure **RQD** Rec. feet feet Advance Remarks Description of Core Press Return % % (psi) 967.3 27.8 (min/ft) (psi) (%) SHAKOPEE FORMATION, SANDSTONE, light brown, moist, 4650 1.0 37 15-20 100 81 highly weathered, soft to moderately hard, fine-grained, thin-bedded, intensely to highly fractured. 966.3 28.8 SHAKOPEE FORMATION, SANDSTONE, light brown, moist, 3.0 highly weathered, soft to moderately hard, fine-grained, thin-bedded, highly fractured, vuggy. 965.3 29.8 SHAKOPEE FORMATION, SANDY DOLOSTONE, light 4650 3.0 15-20 90 97 76 brown and gray, moist, highly weathered, moderately hard, very fine- to fine-grained, thin-bedded, highly to moderately fractured, vuggy, with thin Sandstone and Shale layers throughout. 4 inch layer of green Shale at 34.5 feet. 2.0 Continued Next Page NOTES:

_[O-13-08144			CORIN	G:	ST-2	(cont)
abbreviations	Broad Broad	chnical way at (way Avo ster, M	Cente enue a	r and Center Street			LOCAT	ION: See	e attached	l sketch.	
n of a							DATE:	12/1	9/13	SCALE	1" = 1'
explanatio	Elev. feet 962.3	Depth feet 32.8		Description of Core	Bit Pressure (psi)	Rate of Advance (min/ft)	Press (psi)	Return (%)	Rec.	RQD %	Remarks
.0G OF CORING N:\GINT\PROJECTS\ROCHESTER\2013\08144.GPJ BRAUN_V8_CURRENT.(客色句卷的符记ve Terminology sheet for explanation of abbreviations)	960.3 	34.8		SHAKOPEE FORMATION, SANDY DOLOSTONE, light brown and gray, moist, highly weathered, moderately hard, very fine- to fine-grained, thin-bedded, highly to moderately fractured, vuggy, with thin Sandstone and Shale layers throughout. 4 inch layer of green Shale at 34.5 feet. (continued) SHAKOPEE FORMATION, SANDSTONE, light brown, moist, highly weathered, soft to moderately hard, fine-grained, thin-bedded, intensely to highly fractured, with thin Shale seams throughout. SHAKOPEE FORMATION, SANDY DOLOSTONE, gray and brown, moist, highly weathered, moderately hard, very fine-to-fine-grained, thin-bedded, highly to moderately fractured, vuggy.	4650	3.0	15-20	80	60	39	
CORIN	BRA	UN"	. / . /	Continued Next Page	NOTES:			1			
LOG OF	INTE	RTEC									

		ect RO-13-08144 Evaluation			CORIN	G:	ST-2	2 (cont	i.)
Broad Broad	dway at (Center enue and Center Street			LOCAT	ION: See	e attache	d sketch.	
5					DATE:	12/1	9/13	SCALE	: 1" = 1'
Elev. feet 957.3	Depth feet 37.8	Description of Core	Bit Pressure (psi)	Rate of Advance (min/ft)	Press (psi)	Return (%)	Rec.	RQD %	Remarks
		END OF COREHOLE.							
<u>-</u>		Auger met refusal at 17.8 feet.	_						
<u>-</u>		Rock Coring started at 17.8 feet.							
F		Temporary well installed at 37.8 feet.	-						
		Groundwater observed at 21.9 feet when rechecked after 3 days.	_						
- -		Temporary well, boring and corehole then grouted.	-						
<u></u>									
-									
_		-							
_			-						
-									
-			-						
BR	<u>AUN</u> [™]		NOTES:						
INT	ERTEC								



	n Proje	ct RO-1	3-08	3144			BORING				S	T-3	
Broad ¹ Broad ¹	way at (way Av			er Street			LOCATI	ON	: Se	e att			
DRILLE	R: B.	Oldenberg		METHOD:	3 1/4" HSA, /	Autohammer	DATE:		12/1	9/13		SCALE:	1" = 4'
Elev. feet 997.6	Depth feet 0.0	Symbol	(Soi		escription of M or D2487, Roc	Naterials k-USACE EM11	10-1-2908)	E	3PF	WL	PID (ppm)		r Notes
feet	feet 0.0 1.0	Symbol FILL FILL CONC	FILL Grav FILL coar FILL Silt a	il-ASTM D2488 : Silty Sand, vel, dark brow : Poorly Grac rse-grained, tr	or D2487, Roc fine- to coars n, moist. ded Sand with ace of Gravel etrieved as Pe	k-USACE EM11 e-grained, trace n Silt, fine- to l, brown, moist oorly Graded St light gray, mo	ce of		8 2 *	WL	PID (ppm) 17.1 11.5 46.0		
- - - -							- - - - -	_					
- 							- 	-					

Braun Project RO-13-08144 ST-3 (cont.) CORING: **Geotechnical Evaluation** .OG OF CORING N:\GINT\PROJECTS\ROCHESTER\2013\08144.GPJ BRAUN_V8_CURRENT.G图64T的Striptive Terminology sheet for explanation of abbreviations) LOCATION: See attached sketch. **Broadway at Center Broadway Avenue and Center Street** Rochester, Minnesota DATE: 12/19/13 SCALE: 1" = 1' Rate of Water Elev. Depth Bit Pressure **RQD** Rec. feet feet Advance Remarks Description of Core Press Return (psi) 989.8 7.8 (min/ft) (psi) (%) SHAKOPEE FORMATION, SANDY DOLOSTONE, brown 4650 15-20 70 0.8 33 0 989.8 7.8 and light gray, moist, decomposed to highly weathered, moderately hard, very fine- to fine-grained, thin-bedded, intensely to highly fractured, vuggy. 40 0.3 10 0.7 2.0 984.8 Continued Next Page NOTES:

Braun Project RO-13-08144 ST-3 (cont.) CORING: **Geotechnical Evaluation** .OG OF CORING N:\GINT\PROJECTS\ROCHESTER\2013\08144.GPJ BRAUN_V8_CURRENT.G图64T的Striptive Terminology sheet for explanation of abbreviations) LOCATION: See attached sketch. **Broadway at Center Broadway Avenue and Center Street** Rochester, Minnesota DATE: 12/19/13 SCALE: 1" = 1' Rate of Water Elev. Depth Bit Pressure **RQD** Rec. feet feet Advance Remarks Description of Core Press Return (psi) 12.8 984.8 (min/ft) (psi) (%) SHAKOPEE FORMATION, SANDY DOLOSTONE, brown 2.2 15-20 4650 0 53 8 and light gray, moist, very soft to moderately hard, very fine-to fine-grained, thin-bedded, intensely to highly fractured, vuggy. Decomposed layers of Dolostone retrieved as "Silt (ML)" throughout. 2.3 2.1 2.2 4.8 979.8 Continued Next Page NOTES:

Braun Project RO-13-08144 ST-3 (cont.) CORING: **Geotechnical Evaluation** .0G OF CORING N:\GINT\PROJECTS\ROCHESTER\2013\08144.GPJ BRAUN_V8_CURRENT.GReb/政路的中 LOCATION: See attached sketch. **Broadway at Center Broadway Avenue and Center Street** Rochester, Minnesota DATE: 12/19/13 SCALE: 1" = 1' Elev. Rate of Water Depth Bit Pressure Rec. **RQD** feet feet Advance Remarks Description of Core Press Return (psi) 17.8 979.8 (min/ft) (psi) (%) SHAKOPEE FORMATION, SANDY DOLOSTONE, brown 4650 15-20 2.0 0 6 0 and light gray, moist, decomposed to highly weathered, moderately hard, very fine- to fine-grained, thin-bedded, intensely fractured, vuggy. 2.1 2.0 2.5 2.2 974.8 Continued Next Page NOTES:

Braun Project RO-13-08144 ST-3 (cont.) CORING: **Geotechnical Evaluation** .0G OF CORING N:\GINT\PROJECTS\ROCHESTER\2013\08144.GPJ BRAUN_V8_CURRENT.GBeb1秒esthiptive Terminology sheet for explanation of abbreviations) LOCATION: See attached sketch. **Broadway at Center Broadway Avenue and Center Street** Rochester, Minnesota DATE: 12/19/13 SCALE: 1" = 1' Rate of Water Elev. Depth Bit Pressure **RQD** Rec. feet feet Advance Remarks Description of Core Press Return (psi) 22.8 974.8 (min/ft) (psi) (%) SHAKOPEE FORMATION, SANDY DOLOSTONE, brown 3.2 ** END OF 4650 20 0 32 and light gray, moist, decomposed to highly weathered, COREHOLE. moderately hard, very fine- to fine-grained, thin-bedded, Auger met intensely to highly fractured, vuggy. refusal at 7.8 feet. 2.5 Rock Coring started at 7.8 feet. 1.5 Boring and corehole then grouted. 1.6 1.5 969.8 NOTES:



ſ	Braur			3-08144		BORING:				T-4	
			Evaluation								
		way at (LOCATIO	IN: Se	e au	acne	a sketch.	
ions				Center Street							
viat	Roche	ster, M	innesota								
See Descriptive Terminology sheet for explanation of abbreviations)	DRILLE	R: K.	Keck	METHOD: 3 1/4" HSA,	Autohammer	DATE:	12/2	20/13		SCALE:	1" = 4'
o o	Elev.	Depth									
tion	feet	feet	0	Description of N			BPF	WL	PID		or Notes
ans	997.3 997.0	0.0	Symbol	(Soil-ASTM D2488 or D2487, Roc		J-1-2908)	Т		(ppm	/	
exb	_ 337.0 7 _	\U.3	FILL	FILL: Clayey Sand, brown, we							
it for	995.3	2.0									
hee			FILL	FILL: Clayey Sand, dark brown	n, moist.		V 21		0.0		
g y	-					-	<u> </u>		0.0		
임	993.3	4.0	FILL XX	FILL: Clayey Sand, brown, mo	niet						
ermi				TILL. Clayey Cand, brown, mo	not.	_					
e T						ľ	11		0.0		
ripti	990.3	7.0									
esci	_ 990.5	7.0	DOL Z	SHAKOPEE FORMATION, SA							
e D	_			light brown and light gray, dry, fine- to fine-grained. Retrieved	highly weathered	d, very	50		0.0		
S)	_			with Gravel-sized pieces of Do	lostone in split-s	poon –					
			7	sampler.							
							*		0.0	* 30/6" (set), then 50/6"
	_		- /								
	985.3	12.0	DOL 7	SHAKOPEE FORMATION, SA	NDY DOLOSTO	ONF					
	_			brown, moist decomposed, ver	y fine- to fine-gra	ained. 🗐	25		0.0		
	_			Retrieved as "Clayey Sand (SC sampler.	n split-spoon)" in split-spoon						
	982.7	14.6	7	END OF BORING - REFUSAL	TO ALICED AT	14.6	*			* 50/2" (set)
1:16				FEET.	TO AUGENTAL	14.0					
1/5/15 14:16	_			Water not observed while drilling	na						
	-					-					
NT.GDT	_			Water not observed to cave-in immediately after withdrawal of		_					
CURRENT	_			Boring then backfilled.		_					
3AUN	_					_					
PJ BF	_										
144.G											
3\08	_										
1/201	_					-					
ESTE											
ROCH	_					_					
:CTS\	_										
PROJE											
)\TNI	_										
N:\G	-					-					
BORING N:\GINT\PROJECTS\ROCHESTER\2013\08144.GPJ BRAUN_V8											
OF BO	_					_					
0 907	PO 13 091				oration Planmington						ST 4 nogo 1 of 1



ſ	Braur			3-08144	BORING				T-5	
		-	Evaluatio		LOCATIO					
	Broad	way at (Center		LOCATIC	JN. SE	e au	acne	J SKEICH.	
ions				Center Street						
viat	Roche	ster, Mi	innesota							
See Descriptive Terminology sheet for explanation of abbreviations)	DRILLE	R: K.	Keck	METHOD: 3 1/4" HSA, Autohammer	DATE:	12/2	20/13		SCALE:	1" = 4'
o jo	Elev.	Depth								
tion	feet	feet		Description of Materials		BPF	WL	PID		or Notes
ana	997.6	0.0	Symbol	(Soil-ASTM D2488 or D2487, Rock-USACE EM1110	0-1-2908)			(ppm)	
dxe	997.2 ↓996.9	0.4	CONC AGG 🔆	√5 inches of Concrete Pavement. √3 inches of Aggregate Base.						
for	995.6	2.0	FILL	FILL: Sandy Lean Clay, trace of organics, blac	k moist			0.0		
eet	_ 995.0	2.0	FILL XX	FILL: Sandy Lean Clay, brown, moist.						
v sh	_			3 , ,	_	12		0.0		
힝	993.6	4.0				Н				
Шi			SP	POORLY GRADED SAND, fine- to medium-gra	ained,					
Ter				brown, moist, loose. (Alluvium)		10		0.0		
tive	_			(_	Η				
crip	_				_					
Des						10		0.0		
See	_			- Trace of Gravel at 8 feet.	_	М .		0.0		
9	_				_					
				- Trace of Clay from 9 to 12 feet.		₩ 40				
						10		0.0		
	985.6	12.0			_					
	_ 900.0	12.0	DOL /	SHAKOPEE FORMATION, SANDY DOLOSTO	ONE,					
	_		7/	brown and light gray, moist, decomposed to high	ghly _	51		0.0		
	983.6	14.0	7	weathered, very fine- to fine-grained. Retrieve	o as Sandv —	П				
			DOL	∖Dolostone in split-spoon sampler.						
:16				SHAKOPEE FORMATION, SANDY DOLOSTO brown and light gray, moist, decomposed to high		22		0.0		
15 14	_		7	weathered, very fine- to fine-grained. Retrieve	d as	H				
1/5/15 14:16	_			"Silty Gravel (GM)" with Sand in split-spoon sa	mpler					
GDT			7			*			* 50/1" (set))
	979.1	18.5	7	END OF BORING - REFUSAL TO AUGER AT	10 1/2					
CURRENT	_			FEET.	10 1/2 _					
				Water not observed while drilling at 10 1/2 feet						
BRAUN_V8	_			·	_					
	_			Water not observed to cave-in depth of 12 feet inches immediately after withdrawal of auger.	9 _					
144.G				, , , , , , , , , , , , , , , , , , ,						
3\08:	_			Boring then grouted.	_	1				
\201	_				_					
STER										
OCHE	_				_					
TS\R										
OJEC	_				_					
JT\PR	_				-					
I:\GIN	_				_					
2 2										
BORING N:\GINT\PROJECTS\ROCHESTER\2013\08144.GPJ						1				
P.	_				_					
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		Evaluatio	13-08144 on	BORING: ST-6 LOCATION: See attached sketch.							
Broad		enue and	Center Street	LOCATIC	JN. Se	e au	lacrie	u skelon.			
DRILLE		innesota _{Keck}	METHOD: 3 1/4" HSA, Autohammer	DATE:	12/1	19/13		SCALE:	1" = 4		
Elev. feet	Depth feet		Description of Materials	•	BPF	WL	PID	Tests	or Notes		
997.2	0.0		(Soil-ASTM D2488 or D2487, Rock-USACE EM11	10-1-2908)			(ppm)			
995.2	2.0	FILL	FILL: Poorly Graded Sand with Silt, fine- to coarse-grained, trace of Gravel, brown, wet.	_							
993.2	2.0	FILL	FILL: Poorly Graded Sand with Silt, fine- to coarse-grained, trace of Gravel, brown, moist	· _	12		0.0				
990.2	7.0				20		0.0				
		FILL	FILL: Silty Sand, fine- to coarse-grained, with brick, and concrete debris, brown, moist.	Gravel,	21		0.0				
985.7	11.5				6		0.0				
900.7	11.5	XXX	END OF BORING - REFUSAL TO AUGER A FEET.	T 11.5 _							
			Water not observed while drilling.	_							
_			Water not observed to cave-in depth of 9 feet immediately after withdrawal of auger.	- -							
			Boring then backfilled.	_							
				-							
				_							
				_							
_				_							
				-							
				_							
_											
				_							



ſ	Brauı	n Proje	ect R	0-1	3-08	144				BORING:				_	ST-7		
		chnical way at (n					LOCATIO	N:	Se	e att	ache	d sketch.		
ons)					Cente	er Street											
viati		ster, M															
abbreviations)	DRILLE	:R: K.	Keck			METHOD:		3 1/4" HSA, Auto	hammer	DATE:		12/2	20/13		SCALE:	1" =	4'
n of	Elev. feet	Depth feet				D	ക്ക	cription of Mate	rials		ь	PF	WL	PID	Toots	s or Notes	
natio	997.2	0.0	Sym	bol	(Soil			D2487, Rock-U		0-1-2908)		1	VVL	(ppm		S OF NOTES	•
expla			FILL					ed Sand with Si h Gravel, trace		wn							
fore	995.2	2.0			mois		7	i Graver, trace	01 10013, 510	wii, _				4.0			
shee			FILL					ed Sand with Si ce of Gravel, br		moiet	Н	28		21.0	1		
ò	_				Coar	sc-grained, t	ia	oc of Glavel, bi	own, dry to i	110131	Å	_0		21.0			
mino	_									_							
e Ter				\bowtie							M	31		0.0			
riptiv	- 990.2	7.0								_							
(See Descriptive Terminology sheet for explanation of	989.2		CONC					eved as Poorly	Graded Sar	nd with	М	21		0.0			
See	000.2	0.0	FILL			ınd Gravel, li : Clayey Saı		, brown, moist.			Å	4 I		0.0			
	_	986.7 10.5								_							
ŀ	986.7	986.7 10.5 SS						in auger cuttin IATION, SAND	~		M	5		6.0			
ľ	- 085.2					t, decompos	ed	, very fine- to fi	ne-grained.								
ľ	300.2	12.0	DOL					Sand (SM)" in s IATION, SAND			M	*		0.0	* 30/6" (se	at) than l	50/6"
ľ	_						st, decomposed e- to fine-graine		d as				0.0	30/6 (Se	et), trieri s	50/6	
ľ	_			=	"Silty	Sand (SM)" stone in split		_									
:17					Doio	storic iii spiit	t-3	poon sampici.		_	×	*		0.0	* 43/6" (se	et), then t	50/4"
/15 14	- 980.2	17.0								_							
GDT 1/5/15 14:17	900.2	17.0	DOL		SHA	KOPEE FOR	RΝ	IATION, SAND	Y DOLOSTO	ONE,							
	_				weat	hered, very f	fine	orown, moist, d e- to fine-graine	ed. Retrieve	d as							
CURRENT	<u> </u>	19.2		7				with Sand in sp cored borehol		mpler		*			* 50/2" (se	et)	
8 N N						.9											
BRAU	_									_							
44.GPJ	_									_							
3\081	-									_							
R\201	-									_							
CHESTE	_																
rs\roo	-									_							
ROJEC	-									_							
INT\PI	-									_							
S) N:\G	_									-							
SORINC																	
LOG OF BORING N:\GINT\PROJECTS\ROCHESTER\2013\08144.GPJ BRAUN_V8	-									-							
٩ ل	RO-13-0814	14				R	rau	n Intertec Corporation	n Bloomington I	MN 55438						ST-7 pa	go 1 of F

Braun Project RO-13-08144 ST-7 (cont.) CORING: **Geotechnical Evaluation** .OG OF CORING N:\GINT\PROJECTS\ROCHESTER\2013\08144.GPJ BRAUN_V8_CURRENT.G图64T的Striptive Terminology sheet for explanation of abbreviations) LOCATION: See attached sketch. **Broadway at Center Broadway Avenue and Center Street** Rochester, Minnesota DATE: 12/20/13 SCALE: 1" = 1' Rate of Water Elev. Depth Bit Pressure **RQD** Rec. feet feet Advance Remarks Description of Core Press Return % (psi) 978.0 19.2 (min/ft) (psi) (%) SHAKOPEE FORMATION, SANDY DOLOSTONE, light 32.55 15-20 26 1.4 78 50 978.0 19.2 brown and gray, moist, highly to moderately weathered, moderately hard, very fine- to fine-grained, thin-bedded, intensely to moderately fractured, with thin seams of Sandstone and Shale throughout. 2.1 2.0 2.5 $Q_u = 7,940$ psi 3.9 973.0 Continued Next Page NOTES:

tions)	Geote		ct RO-13-08144 valuation enter			CORING		ST-7	(con	t.)
abbrevia	Broad		nue and Center Street						1	
n of						DATE:	12/2	0/13	SCALE	E: 1" = 1'
explanatic	Elev. feet 973.0	Depth feet 24.2	Description of Core	Bit Pressure (psi)	Rate of Advance (min/ft)	Press (psi)	ter Return (%)	Rec.	RQD %	Remarks
RRENT. GBG& TXESCHPRIVE Terminology sheet for e	- - - - - - -		SHAKOPEE FORMATION, SANDY DOLOSTONE, light brown and gray, moist, highly to moderately weathered, moderately hard, very fine- to fine-grained, thin-bedded, highly to moderately fractured, with thin seams of Sandstone and Shale throughout.	3255	4.9 3.5 2.1	15-20	65	100	67	
LOG OF CORING N:\GINT\PROJECTS\ROCHESTER\2013\08144.GPJ BRAUN_V8_CURRENT.GSE电和estry Terminology sheet for explanation of abbreviations)	970.5 - - - - - - -	26.7	SHAKOPEE FORMATION, SANDSTONE, light brown, moist, highly to moderately weathered, moderately hard, very fineto fine-grained. Thin-bedded, intensely to moderately fractured, with thin layers of Dolostone throughout.		1.7					
RING N:\GII	 968.0	29.2								
LOG OF CO	BRA INTE		Continued Next Page	NOTES:						

Braun Project RO-13-08144 ST-7 (cont.) CORING: .OG OF CORING N:\GINT\PROJECTS\ROCHESTER\2013\08144.GPJ BRAUN_V8_CURRENT.G图64T的Striptive Terminology sheet for explanation of abbreviations) **Geotechnical Evaluation** LOCATION: See attached sketch. **Broadway at Center Broadway Avenue and Center Street** Rochester, Minnesota DATE: 12/20/13 SCALE: 1" = 1' Rate of Water Elev. Depth Bit Pressure **RQD** Rec. feet feet Advance Remarks Description of Core Press Return % (psi) 29.2 968.0 (min/ft) (psi) (%) SHAKOPEE FORMATION, SANDY DOLOSTONE, gray, 3720 2.7 65 93 57 15-20 moist, highly to moderately weathered, moderately hard, very fine- to fine-grained, thin-bedded, highly to moderately fractured, vuggy, with Calcite nodules throughout. 3.9 2.1 32.2 965.0 SHAKOPEE FORMATION, SANDSTONE, light brown, moist, 1.7 highly to moderately weathered, soft to moderately hard, fine-grained, thin-bedded, intensely to highly fractured. 8.0 Q₀=2,500 psi Continued Next Page NOTES:

Braun Project RO-13-08144 ST-7 (cont.) CORING: **Geotechnical Evaluation** .0G OF CORING N:\GINT\PROJECTS\ROCHESTER\2013\08144.GPJ BRAUN_V8_CURRENT.QBeb/拉德Shiptive Terminology sheet for explanation of abbreviations) LOCATION: See attached sketch. **Broadway at Center Broadway Avenue and Center Street** Rochester, Minnesota DATE: 12/20/13 SCALE: 1" = 1' Rate of Water Elev. Depth Bit Pressure **RQD** Rec. feet feet Advance Remarks Description of Core Press Return % % (psi) 34.2 963.0 (min/ft) (psi) (%) SHAKOPEE FORMATION, SANDSTONE, light brown, moist, ** END OF 3720 2.4 65 15-20 98 86 highly to moderately weathered, soft to moderately hard, COREHOLE. fine-grained, thin-bedded, intensely to highly fractured. 34.8 962.4 SHAKOPEE FORMATION, SANDY DOLOSTONE and DOLOSTONE, gray and light brown, moist, highly to moderately weathered, moderately hard, very fine- to 3.9 Auger met fine-grained, thin-bedded, intensely to slightly fractured. refusal at 19.2 vuggy, with Calcite nodules throughout. feet. 4.2 Rock coring started at 19.2 feet. 4650 2.8 Boring and corehole then grouted. 2.6 958.0 NOTES:



ſ				t RO-13-08	144			BORING:			HA-1	
viations)	Broad Broad	way a way <i>A</i>	at Ce Aven	raluation nter ue and Cento nesota	er Street				st of s	outhwes	nches north ar st corner in CJ	
abbre	DRILLE	R:	A. Kre	eofsky	METHOD:	Hand Auger		DATE:	12/2	23/13	SCALE:	1" = 2'
/15 14:16 (See Descriptive Terminology sheet for explanation of abbreviations)	DRILLE Depth feet 0.0 0.3	ster,	Min A. Kre bol	(Soil-AST 4 inches of Carlotte Poorly trace of Grave SHAKOPEE moist, decom "Lean Clay wi SHAKOPEE moist, decom fione-grained Gravel-sized	Description Description Description D2488 or D2 Description D2488 or D2 Description D2488 or D2 Description D2488 or D24	Hand Auger otion of Materials 2487, Rock-USACE with Silt, fine- to , SANDY DOLOS ne- to fine-graine s)" in hand auger , SANDY DOLOS ly weathered, ver s "Lean Clay with dy Dolostone in h REFUSAL AT 1.5	coarse-grain STONE, brown d. Retrieve cuttings. STONE, brown y fine- to Sand (CLS nand auger of	DATE: 908) ned, wn, d as wn,)" with	hed sk	etch.	1	1" = 2'
LOG OF BORING N:\GINT\PROJECTS\ROCHESTER\2013\08144.GPJ BRAUN_V8_CURRENT.GDT 1/5/15 14:16						aun Intertec Corporatio		- - - - - - - - - - - - - - - - - - -				HA-1 page 1 of 1



	n Proje	ct RO-13-08	3144		E	BORING:			HA-2	
Broad	way at C	nue and Cent	er Street		r				uth and 26 feet 's basement. S	
DRILLE	R: A. Þ	íreofsky	METHOD:	Hand Auger	[DATE:	12/2	3/13	SCALE:	1" = 2'
DRILLE Depth feet 0.0	ER: A. F	(Soil-AS' 4 inches of C SHAKOPEE and brown, n to fine-graine sized pieces	Descrip TM D2488 or D2 concrete Slab. FORMATION hoist, decompoid. Retrieved of Sandy Dolo	otion of Materials 2487, Rock-USACE EM1110	0-1-290 , dark t I, very vith Gra tings.	8) prown fine-	BPF	WL WL	SCALE: Tests or	
- - - - -						- - - - - - - -				
LOS OF BOXING N: JOHN 1/PROJECT S/ROUTESTER/2013/08144-073 BRADIN_VS_CORRENT.GDT 1/3/12-14-150						- - - - - - - - - - - - - - - - - - -				



Braun Projec		144		BORING	:		HA-3	
Geotechnical E Broadway at C Broadway Ave Rochester, Mir	enter nue and Cent	er Street		southwe	st corne	er in Jak	th and 41 feet obson Managed sketch.	
DRILLER: A. K	reofsky	METHOD:	Hand Auger	DATE:	12/2	23/13	SCALE:	1" = 2'
Rochester, Mir	(Soil-AST 2 1/2 inches of FILL: Clayey SHAKOPEE moist, decom fine-grained. Gravel-sized	Descript D2488 or D2 of Concrete S Sand, trace of FORMATION posed to high Retrieved as pieces of San	otion of Materials 2487, Rock-USACE EM	DATE: 11110-1-2908) n, moist. DNE, brown, ne- to with d auger cuttings.			_ 	
_				- - - - - - -				
_				- - - - - -				



Braui			t RO-13-08	144			BORING:			HA-4	
Broad	way a way A	t Ce lven	ue and Cente	er Street			northwest	corne	r in Gin	outh and 12 1/2 iny's Fine Fabri ed sketch.	
DRILLE	:R: /	A. Kre	eofsky	METHOD:	Hand Auger		DATE:	12/2	23/13	SCALE:	1" = 2'
Depth feet 0.0	Syml	ool	(Soil-AST	Descrip M D2488 or D2	908)	BPF	WL	Tests or	Notes		
= 0.5 - 0.5	CONC	2 4 A	6 inches of C	oncrete Slab.							
- 1.4	SS		brown, moist,	decomposed	, SANDSTONE, b , very fine- to fine and auger cutting	-grained. F					
Cost of Booking in: Glinty Project's RROJECT's ROCHESTER (2013/08144.GP) Broad B	DOL		SHAKOPEE light brown, m to fine-grained hand auger c	FORMATION noist, decomposite d	and auger cutting, SANDY DOLOS osed to highly were as "Lean Clay with REFUSAL AT 1.7	TONE, brow athered, ve in Sand (CL	ry fine-				
06 OF BORING N:)							_ _ _				



Braun Proje	ct RO-13-08144	BORING:			HA-5	
Geotechnical E Broadway at C Broadway Ave Rochester, Mir	enter nue and Center Street		corner	r in Gini	th and 17 feet only's Fine Fabric	
ପୁର DRILLER: A. K	reofsky METHOD: Hand Auger	DATE:	12/2	23/13	SCALE:	1" = 2'
Depth feet 0.0 Symbol 0.2 CONC	Description of Materials (Soil-ASTM D2488 or D2487, Rock-USACE \$\frac{1}{2}\$ 2 1/2 inches of Concrete Slab.	EM1110-1-2908)	BPF	WL	Tests or I	Notes
Broadway Ave Rochester, Min DRILLER: A. K Depth feet 0.0 Symbol O.2 CONO Symbol O.3 SS O.4 DOLD O.5	FILL: Poorly Graded Sand with Silt, fine- to brown, dry to moist. SHAKOPEE FORMATION, SANDSTONE, I decomposed, very fine- to fine-grained. Ret Sand (SC)" in hand auger cuttings. SHAKOPEE FORMATION, SANDY DOLOS moist, decomposed to highly weathered, ver fine-grained. Retrieved as "Lean Clay with S Gravel-sized pieces of Sandy Dolostone in END OF HAND AUGER - REFUSAL AT 2 F	prown, moist, rieved as "Clayey STONE, brown, y fine- to Sand (CLS)" with and auger cuttings.				



Braun Projec	ct RO-13	3-08144A		BORING:			S	T-08	
Drilling Investig	gation			LOCATIO		e att			
Broadway at Co		Camban Chua at			00				
Broadway Ave		Center Street							
DRILLER: R. H	lansen	METHOD:	3 1/4" HSA, Autohammer	DATE:	1/30	0/14		SCALE:	1" = 4'
Elev. Depth feet feet			scription of Materials		BPF	WL	PID		or Notes
997.6 0.0	Symbol		or D2487, Rock-USACE EM111	0-1-2908)			(ppm))	
criptive Terminology sheet for explar	DOL	FILL: Poorly Grad coarse-grained, tra brown, frozen to me SHAKOPEE FOR light brown and lig weathered, very fin "Silty Sand (SM)" Dolostone.	ed Sand with Silt, fine- to ace of Gravel to with Gravel noist at 3 feet. MATION, SANDY DOLOSTO ht gray, moist, decomposed ne- to fine-grained. Classifie with Gravel-sized pieces of Sandal and the composed of the composed	at 6 feet,	19 8 *		0.6 0.4 0.5 0.4	* 4" (set), 5	0/9"



			3-08144A	BORIN	IG:			S	T-09	
	g Invest way at (igation Center		LOCAT	ГΙΟ	N: Se	e att	ache	d sketch.	
Broad	way Av	enue and	Center Street							
		innesota	METHOD: 2.4/4#UCA Autobossess	DATE		4/0	2/4.4	1	COALE:	411 – 41
DRILLE Elev.		Hansen	METHOD: 3 1/4" HSA, Autohammer	DATE:		1/30	0/14		SCALE:	1" = 4'
feet	Depth feet		Description of Materials			BPF	WL	PID		or Notes
995.5	0.0	Symbol FILL	(Soil-ASTM D2488 or D2487, Rock-USACE EM1 FILL: Silty Sand, fine- to coarse-grained, tra		1	<u> </u>		(ppm)	
			Gravel, brown, frozen.	ice oi	_					
993.5	2.0	FILL XX	FILL: Poorly Graded Sand with Silt, fine- to					2.0		
			coarse-grained, brown, frozen to moist at 6	feet.	-					
						63*		1.8	* High blow	v counts like t.
-				-	-					•
						35		0.1		
					-					
					-	3		0.2		
					-					
					_	30		0.1		
					-					
					-			0.1		
			- Concrete, coal slag and cinder debris at 13	B feet.	+	3				
					4			0.1		
_				-		1				
070.5	47.0				4			0.1		
978.5	17.0		END OF BORING - REFUSAL TO AUGER	AT 17		*			* 50/3" (se	t)
			FEET.		-					
			Water not observed while drilling.		_					
			Boring then backfilled.							
					_					
					_					
,										
					_					
_				-						
,					_					
					7					
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		3-08144A	BORING:				T-10	
Drilling Invest Broadway at Broadway Av Rochester, M	Center renue and	Center Street	LOCATIO	N: Se	e att	tache	d sketch.	
	. Hansen	METHOD: 3 1/4" HSA, Autohammer	DATE:	1/3	0/14		SCALE:	1" = 4
Elev. Depth feet	0	Description of Materials		BPF	WL	PID		or Notes
998.0 0.0		(Soil-ASTM D2488 or D2487, Rock-USACE EM1110)-1-2908)			(ppm)	
990.0 8.0	FILL	FILL: Poorly Graded Sand with Silt, fie- to coarse-grained, with Gravel, brown, moist. FILL: Concrete, classified as Poorly Graded Sa Silt and Gravel, light brown and light gray, moist. END OF BORING - REFUSAL TO AUGER AT FEET. Water not observed while drilling. Boring then backfilled.	and with			0.7 1.0 1.4 2.8 1.2	* 50/4" (set)	



ſ		n Proje		0-1	3-08	3144A			BORING:			S	T-11	
1	Drillin	g Invest	igatio	on					LOCATIO		e att			
(S		way at (LOOMING) 11. OC	c an	acric	a okcion.	
ation		way Ave ster, Mi			Cent	er Street								
bbrevi	DRILLE		Hanser			METHOD:	3 1/4" HSA, A	Autohammer	ohammer DATE: 1/30/14				SCALE:	1" = 4'
ion of a	Elev. feet	Depth feet				Description of Materials				BPF	WL	PID	Tests o	or Notes
anat	997.6	0.0	Sym					-USACE EM1110	0-1-2908)			(ppm)	
ğ	997.2 996.9	0.4	PAV AGG				ete pavement	•						
φ	= 990.97	U.L.	FILL			ches of Aggre	gate Base. n Clay, brown,	frozen						
sheet	994.6	3.0				•						2.0		
minology	_		FILL		FILL med	.: Poorly Grad lium-grained, l	ded Sand with brown, frozen	Silt, fine- to to moist at 5 fe	et	32*		0.2	* High blow due to frost	counts likely
See Descriptive Terminology sheet for explanation of abbreviations)	_									20		0.5		
(See De	_								_	10		0.4		
-										12		0.2		
-	_	44.0							_	16		0.4		
ŀ	983.6	14.0	DOL	$\stackrel{\times\!\!\times\!\!\!\times}{/}$	SHA	KOPEE FOR	MATION. SAI	NDY DOLOSTO	ONE.			0.1		
14:30	 981.6	16.0			brow fine-	vn, moist, deo · to fine-graine	cmposed to hed. Classified	ighly weathered as "Clayey Sar dy Dolostone.	d, very	12				
GDT 1/5/15 14:30	_					OF BORING		TO AUGER AT	16			0.4		
	_				Wate	er not observe	ed while drillin	g.	_					
1_V8_CUI	_				Borir	ng then backf	illed.							
y BRAUN	_								_					
3144A.GF	_								_					
\2013\08	_								_					
CHESTER														
JECTS\RC	_								_					
INT\PRO	_								_					
NG N:\G	_								_					
LOG OF BORING N:\GINT\PROJECTS\ROCHESTER\2013\08144A.GPJ BRAUN_V8_CURRENT	_								_					
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		ct RO-1	3-08	144A			BORING	:		S	T-12	
Drilling Broads	g Invest way at (igation Center					LOCATIO	DN: Se	ee att	tache	d sketch.	
Broad	way Ave	enue and	Cente	er Street								
Roche: DRILLE		innesota Hansen	METHOD: 3 1/4" HSA, Autohammer				DATE:	1/2	1/14		1" = 4'	
Elev.	Depth	Tansen					DATE.	1/3	1/14		SCALE:	1 -4
feet 997.2	feet	Cumph al	(O - ii		escription of Mate		0.4.0000\	BPF	WL	PID		or Notes
997.2	0.0	Symbol FILL	FILL	: Poorly Grad	or D2487, Rock-US ded Sand with Sil	t, fine- to	•			(ppm)	
-			coars	se-grained, tr	ace of Gravel, br	own, frozen	to moist _	-				
-							_	-		0.2		
-			- Odo	or noted at 3	to 4 feet.		_					
-							_	34*		0.2	* High blow	v counts like t.
_												
							_	24		0.2		
989.7	7.5						_					
-		FILL	FILL: brow	: Silty Sand, n, moist.	fine- to coarse-gr	ained, with	Gravel, _	37		0.3		
-					ete debris at 8 fee	et.	_					
								7		1.1		
-							_	\prod				
985.2	12.0		END	OF BORING	G - REFUSAL TO	AUGER AT	12					
-			FEE.				_					
			Wate	er not observe	ed while drilling.		_					
_			Borir	ng then backf	illed.							
-							_	-				
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ſ		n Proje	ct RO-1	3-08	3144A			BORING:			S	T-13	
	Drillin	g Invest	igation					LOCATIO		e att			
ns)		way at (Center enue and	Cente	er Street								
viatio			innesota	CCIIC	ci street								
appre	DRILLE	R: R.	Hansen		METHOD:	3 1/4" HSA, Autor	nammer	DATE:	1/3	1/14		SCALE:	1" = 4'
ition of a	Elev. feet	Depth feet	Complete al	Description of Materials (Soil-ASTM D2488 or D2487, Rock-USACE EM11				0.4.0000)	BPF	WL	1		or Notes
lana	997.2	0.0	Symbol FILL					0-1-2908)			(ppm)	
LOG OF BORING N:\GINT\PROJECTS\ROCHESTER\2013\08144A.GPJ BRAUN_V8_CURRENT.GDT 1/5/15 14:30 (See Descriptive Terminology sheet for explanation of abbreviations)	985.2	12.0	DOL 7/7	- Col SHA brow weat "Silty END FEE Wate	: Poorly Graces se-grained, we se-grained, we note that the second secon	at 8 feet. MATION, SANDY noist, decompose ne- to fine-grained to while drilling.	, fine- to frozen to n DOLOSTO d to highly d. Classifie	noist at 6	99* 26 28 17 50		0.8 0.9 0.4 0.6 1.0		counts likely
LOG OF BC	- 12 081/					oun Intertee Corporation							T 12 page 1 of 1